Name: Date:

Polynomial Factoring solution (version 647)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 12x + 60 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(12) \pm \sqrt{(12)^2 - 4(1)(60)}}{2(1)}$$

$$x = \frac{-(12) \pm \sqrt{144 - 240}}{2(1)}$$

$$x = \frac{-12 \pm \sqrt{-96}}{2}$$

$$x = \frac{-12 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{-12 \pm 4\sqrt{6}\, i}{2}$$

$$x = -6 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-4 + 8i$ and $-5 - 2i$ in standard form $(a + bi)$.**

Solution

$$(-4 + 8i) \cdot (-5 - 2i)$$

$$20 + 8i - 40i - 16i^2$$

$$20 + 8i - 40i + 16$$

$$20 + 16 + 8i - 40i$$

$$36 - 32i$$

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3. **Write function $f(x) = x^3 - 7x^2 + 4x + 12$ in factored form. I'll give you a hint: one factor is $(x - 2)$.**

Solution

	1	-7	4	12
2		2	-10	-12
	1	-5	-6	0

$$f(x) = (x-2)(x^2 - 5x - 6)$$

$$f(x) = (x-2)(x-6)(x+1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+1) \cdot (x-2)^2 \cdot (x-5)^2$$

Sketch a graph of polynomial $y = p(x)$.